The Epidemiology of Nonfatal Injuries among US Children and Youth

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ABSTRACT

Objectives. National data are not routinely available regarding the incidence of and associated risk factors for nonfatal injuries in children and youth. The Child Health Supplement to the 1988 National Health Interview Survey provided an opportunity to determine accurate national estimates of childhood injury morbidity by demographic factors, location, external cause, nature of injury, and other factors.

Methods. The closest adult for 17 110 sampled children was asked whether the child had had an injury, accident, or poisoning during the preceding 12 months and about the cause, location, and consequences of the event. An analysis for potential underreporting from 12 months of recall provided adjustments of annual rates to those for a 1-month recall period.

Results. On the basis of 2772 reported injuries, the national estimated annual rate for children 0 to 17 years of age was 27 per 100 children after adjustment to 1-month recall. Boys experienced significantly higher rates than girls (risk ratio [RR] = 1.52, 95% confidence interval [CI] = 1.37, 1.68), and adolescents experienced the highest overall rate (38 per 100 children) and proportion of serious injuries.

Conclusions. Approximately one fourth of US children experience a medically attended injury each year, but the risks vary considerably depending on the characteristics of subgroups and the injury cause. (*Am J Public Health.* 1995;85:932–938)

Introduction

With advances in modern medicine and the control of infectious diseases in the middle of this century, injuries have emerged as the principal threat to the health and welfare of children and adolescents.[1,2] However, only in the past decade has a surge of interest, policies, and resources been aimed at prevention.[3–5] Surveillance and research to enhance our understanding of factors associated with injuries and the processes by which they occur are critical to control and prevention.[3,6,7] Vital statistics regarding fatal injuries are regularly collected at the time of death; *International Classification of Diseases,* 9th edition (ICD-9), E codes are used in compiling these statistics.[8,9] Even though the incidence of injury morbidity greatly exceeds that of injury mortality,[10–13] data on nonfatal injuries have not been routinely available to determine similar nationally representative incidence rates and associated risk factors.

Several surveillance systems (e.g., the National Electronic Surveillance System and the Fatal Accident Reporting System) collect injury data targeted toward specific causes or populations. The Statewide Childhood Injury Prevention Program of Massachusetts has provided estimates of the relationship between fatal and nonfatal injuries.[10,11] Reports from emergency rooms, trauma centers, and hospital sources provide valuable information but have limitations due to sampling sources.[13] Quantifying the national experience and identifying risk factors and possible determinants with a view toward injury prevention and control require a reliable source of national data.

The Child Health Supplement to the 1988 National Health Interview Survey (NHIS) included questions on the circumstances, causes, and impact of all medically attended nonfatal injuries for a representative sample of US children and adolescents.[14] These data permit the derivation of national estimates of nonfatal injury rates and examination of the relationships between childhood injuries and sociodemographic, health, and behavioral factors also collected in the Child Health Supplement. This report presents a summary of the epidemiology of injuries among the US population 0 to 17 years of age based on the 1988 Child Health Supplement data.

Methods

The NHIS uses a complex multistage probability sampling design and continuous household interviews throughout the sampling year to obtain a representative sample of the civilian noninstitutionalized population residing in the United States. The 1988 survey was completed in 47 485 homes throughout calendar year 1988; the response rate was 95%. From each survey family household with children, one child 17 years of age or younger was selected for

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the Child Health Supplement sample according to a predetermined probability of birth order. The Child Health Supplement sample included 17 110 children and adolescents (the overall response rate was 91%). This represented 64 million children in the United States after the poststratification variables of age, race, and sex had been weighted to adjust for nonresponse. Weights adjusting the data to reflect the actual probability of national estimates were applied according to age, race, and sex (based on the current US census estimates of the population in 1988).

The Child Health Supplement collected information regarding social and economic characteristics, acute and chronic conditions, restricted and limited activity, physician contacts, and any other health care use. For each child, the closest adult, usually the mother, was asked whether the child had experienced one or more instances of accident, injury, or poisoning during the preceding 12 months that required medical attention. For each reported event, the parent was asked to specify the cause, the place where it happened, and the consequences that resulted from it.

On the basis of the short description, trained coders classified each reported injury by cause using ICD-9 E codes.[8] For analyses of injuries by cause, E codes were grouped into categories. For example, skate, skateboard, and pedal cycle injuries were grouped together, because of the similarity in the nature of the activities, to form a subgroup large enough for analysis. Injuries were classified as severe if they resulted in hospitalization, loss of activity, or absence from school for at least half a day or if they required surgery (including bone setting or stitches). Injuries not meeting these criteria were classified as minor.

Because of possible bias or underestimates resulting from recall over a 12-month period, we analyzed injury rates by time elapsed between the occurrence of each reported injury and the interview. As expected, estimated annual rates for all injuries declined linearly (from 24.4 per 100 children for a 1-month period to 14.7 per 100 children for the 12-month period) as the interval of recall increased. When analyzed by severity, the rates of relatively minor injuries showed the largest decline in magnitude (from 17.4 per 100 children for a 1-month recall period to 10.2 per 100 children for the 12-month recall). Severe injuries had relatively stable rates across recall periods. Consequently, results presented here were also analyzed by severity of consequences. Coefficients were derived to adjust for the loss of reported injuries due to 12-month recall bias; this procedure provided estimated rates that would be expected on the basis of the 1-month recall interval.[15] The detailed rationale and methods for such adjustment have been reported previously.[15] To estimate annual injury rates for the US population, we applied coefficients adjusting for length of recall to injury rates for those subgroups of sufficient size for stable estimates.

The adjustment procedure increased the standard errors for estimated rates by fourfold to sixfold. The confidence intervals (CIs) for mean adjusted injury rates were a function of the combined observed variance of the reported injuries, the mean number of injuries for 1 month, the mean number of injuries for 12 months, and the covariance for each of the preceding three rates. (The footnote* presents the adjustment procedure and derivation of the confidence intervals for the adjusted means.) We did not attempt

TABLE 1—Injury Rates and Standard Errors for Total, Severe, and Minor Injuries among US Children, by Gender and Age Group

	Rate per 100 Children	SE	Rate per 100 Children Adjusted to 1-Month Recall	SE
All injuries				
Gender				
Male	19.6	0.56	32.4	3.48
Female	12.9	0.51	21.2	2.40
Age group, y				
1–4	14.7	0.77	31.7	5.16
5–9	14.5	0.71	19.7	2.49
10–13	17.8	0.93	24.0	4.30
14–17	22.5	1.00	36.9	6.73
Total	16.3	0.37	27.0	2.22
Severe injuries				
Gender				
Male	7.2	0.39	11.0	1.90
Female	4.4	0.33	6.5	1.40
Age group, y				
1–4	4.4	0.37	11.1	2.49
5–9	5.4	0.41	7.1	1.94
10–13	6.4	0.53	6.7	1.66
14–17	8.7	0.74	11.5	3.25
Total	5.8	0.27	8.8	1.28
Minor injuries				
Gender				
Male	12.4	0.47	21.2	2.91
Female	8.5	0.39	14.6	2.08
Age group, y				
1–4	10.2	0.67	20.8	4.33
5–9	9.1	0.62	12.6	2.20
10–13	11.5	0.76	17.6	4.10
14–17	13.8	0.78	24.4	5.42
Total	10.5	0.32	18.0	1.81

*In calculating confidence intervals for the means adjusted for recall, we designated X_1 as the mean of half the sample with 1-month recall (extrapolated to annual rates), X_{12} as the mean of half the sample with 12-month recall (extrapolated to annual rates), Y_{12} as the mean of the full sample for the 1-year data, and $\bar{A}$ as the adjusted mean (12 months of data adjusted to 1-month recall), where $\bar{A} = Y_{12}X_1/X_{12}$.

From a first-order Taylor's expansion, it can be shown that $\mathrm{Var}(\bar{A}) = \mathrm{Var}(Y_{12}X_1/X_{12})$ is approximately equal to the following formula:

$$[Y_{12}/X_{12} \quad -X_1Y_{12}/X_{12}^2 \quad X_1/X_{12}]$$

$$\mathrm{cov}\begin{bmatrix} X_1 \\ X_{12} \\ Y_{12} \end{bmatrix}\begin{bmatrix} Y_{12}/X_{12} \\ -X_1Y_{12}/X_{12}^2 \\ X_1/X_{12} \end{bmatrix}.$$

With this approximation of the variance of the adjusted mean, 95% confidence intervals were calculated as follows: $\bar{A} \pm 1.96 \cdot \mathrm{Var}(\bar{A})^{1/2}$.

TABLE 2—Rates per 100 Injuries, by Location and Cause

	Home	School	Street	Recreation/ Public Building	Farm	Other/ Unknown	Total Estimated Frequency
Motor vehicle[a]	0.176	0.015	0.709	0.052	0.040	0.061	668 887
Location, %	16.71	1.43	67.39	4.90	3.79	5.77	100.00
Cause, %	2.45	0.48	36.00	2.71	23.18	3.18	6.46
Pedal cycle/skates[b]	0.519	0.044	0.678	0.235	0.033	0.125	1 038 417
Location, %	31.76	2.72	41.52	14.37	2.00	7.64	100.00
Cause, %	7.22	1.41	34.43	12.34	18.97	6.53	10.03
Sports/recreation[c]	0.252	1.096	0.020	0.523	0.006	0.088	1 262 796
Location, %	12.71	55.19	1.02	26.35	0.30	4.44	100.00
Cause, %	3.51	34.83	1.03	27.53	3.45	4.61	12.20
Falls[d]	2.017	0.941	0.158	0.480	0.013	0.178	2 407 515
Location, %	53.26	24.85	4.16	12.67	0.35	4.71	100.00
Cause, %	28.09	29.90	8.00	25.24	7.68	9.33	23.26
Struck/cut[e]	2.447	0.669	0.149	0.404	0.034	0.356	2 580 158
Location, %	60.29	16.48	3.66	9.95	0.84	8.77	100.00
Cause, %	34.08	21.25	7.54	21.25	19.91	18.61	24.93
Burns[f]	0.318	0.003	0.000	0.024	0.008	0.031	244 116
Location, %	82.79	0.81	0.00	6.20	2.16	8.04	100.00
Cause, %	4.43	0.10	0.00	1.25	4.82	1.62	2.36
Animal bites/stings[g]	0.394	0.018	0.124	0.031	0.023	0.074	422 248
Location, %	59.39	2.65	18.66	4.72	3.40	11.18	100.00
Cause, %	5.49	0.56	6.29	1.65	13.13	3.88	4.08
Poisoning[h]	0.345	0.020	0.000	0.000	0.000	0.065	273 261
Location, %	80.29	4.59	0.00	0.00	0.00	15.13	100.00
Cause, %	4.81	0.63	0.00	0.00	0.00	3.40	2.64
Other[i]	0.712	0.341	0.132	0.153	0.015	0.934	1 453 964
Location, %	31.14	14.92	5.77	6.67	0.67	40.82	100.00
Cause, %	9.92	10.84	6.70	8.02	8.85	48.84	14.05
Total estimated frequency	4 564 957	2 001 035	1 252 097	1 208 618	109 446	1 215 209	10 351 362
Location, %	44.10	19.33	12.10	11.68	1.06	11.74	100.00

[a]E800–E825, except for pedestrian & pedal cycles; E827, E829, E840–E847.9, E929–E929.1, E988.5–E988.6.
[b]E800–E807 w/.3, E810–E825 w/.6, E826, E848.
[c]E828, E831, E838.4–E838.5, E883.0, E886.0, E917.0, E927.
[d]E833–E835, E843, E880–E888, except for falls in sports; E929.3, E987.
[e]E916, E917, E917.2–E917.9, E918–E920, E986.
[f]E890–E899, E924, E929.4, E988.1–E988.2, E925.
[g]E905–E906.
[h]E850–E869, E929.2, E980–E982.
[i]E800–E807 w/.2, E810–E825 w/.7, E911–E915, E983, E830, E832, E910, E984, E950–E959, E960–E969, E833–E838, E900–E904, E907–E909, E921–E923, E928.8–E928.9, E929.5–E929.9, E970–E978, E985, E988–E988.1, E988.3–E988.4, E988.8–E999.

to adjust for outcomes of multiple subgroups that occurred with low frequency.

Results

A total of 2773 injuries requiring medical attention were reported for 2335 children during the year preceding the interview. The 347 children with multiple injuries were similar to those with only 1 injury in terms of age and severity. However, a greater proportion of those with multiple injuries were male (67% vs 60%; $P \leq .001$).

Table 1 presents overall rates by gender and age group. Unadjusted rates ranged from 12.9 per 100 children for the 1- to 4-year age group to 22.5 per 100 children for the 14- to 17-year group. The 0- to 1-year age group was not included because this developmentally appropriate group did not present the opportunity for 1-year recall. The overall estimated adjusted injury rate was 27.0 per 100 children (ranging from 19.7 for the 5- to 9-year age group to 36.9 for the 14- to 17-year group). Adjustment for loss due to recall resulted in a 65% increase in the overall estimated rate. The adjustment increased the estimated rate of injury the most for the 1- to 4-year age group (152%), and the least for the 5- to 9-year age group (31%). In the same fashion, adjustment increased the estimated injury rate for minor injuries by 71% and increased the rate for injuries classified as severe by 52%.

Gender and Age

Boys had a significantly higher risk of injury than did girls (risk ratio [RR] = 1.52, 95% CI = 1.37, 1.68). Adjustment to the 1-month rate did not change the magnitude of the risk ratio (1.52, 95% CI = 1.10, 2.11). When examined with age as a continuous variable (data not shown), unadjusted injury rates were lowest for infants less than a year of age but then increased and remained relatively stable until adolescence, when rates for both genders increased. In nearly all age

groups, boys experienced higher rates than girls, with the greatest differences being in the adolescent years (13 to 17 years of age). Boys 13 to 17 years old were about 1.85 times more likely than girls to be injured (95% CI = 1.54, 2.21).

Severity

Results by severity for each age group (Table 1) showed that the youngest children experienced both the lowest overall rate of injury and the lowest proportion of serious injuries (17.7%). Conversely, adolescents 14 to 17 years of age experienced the highest overall rate and proportion of serious injuries (38.7%). Adjustment for loss due to recall resulted in higher rates of both severe and minor injuries for all four age groups. However, the 1- to 4-year age group increased proportionately more, and, after adjustment this group did not have significantly lower rates than the older age groups for either minor or serious injuries.

Socioeconomic Status

Higher levels of mother's education, family income, and health care coverage were positively associated with reported injury rates. The injury rate for children whose mothers had more than 12 years of education was 17.5 (per 100 children) (95% CI = 16.1, 18.9), while that for children whose mothers had less than 12 years of education was 11.6 (95% CI = 9.9, 13.3). The rate for children in families with an income of more than $40 000 was 18.1 (95% CI = 16.5, 19.8), and the rate for children in families with an income of $10 000 to $24 999 was 13.1 (95% CI = 11.7, 14.5). Finally, the rates for children in families with health insurance coverage, Medicaid coverage, and no health insurance coverage were 16.8 (95% CI = 15.8, 17.7), 12.3 (95% CI = 10.1, 14.5), and 9.8 (95% CI = 8.2, 11.3), respectively. However, with adjustment to 1-month recall rates, the suggested trend involving these factors, although still evident, was not statistically significant.

The distribution of injuries (unadjusted for recall) by cause showed significantly higher rates of injury associated with bicycles, sports, falls, and being struck or cut in Whites than in Blacks (data not shown). Families at the highest income level (>$40 000) reported more bicycle and sports injuries than those with incomes under $25 000. All other causes of injury were similar for all income groups, and the lowest income groups (<$10 000 and $10 000 to $25 000) did not experience rates of injury above those of the higher income groups. Respondents with health insurance reported significantly more injuries associated with bicycles, sports, falls, and being struck or cut than those with no insurance and more injuries involving bicycles and sports than those with Medicaid coverage.

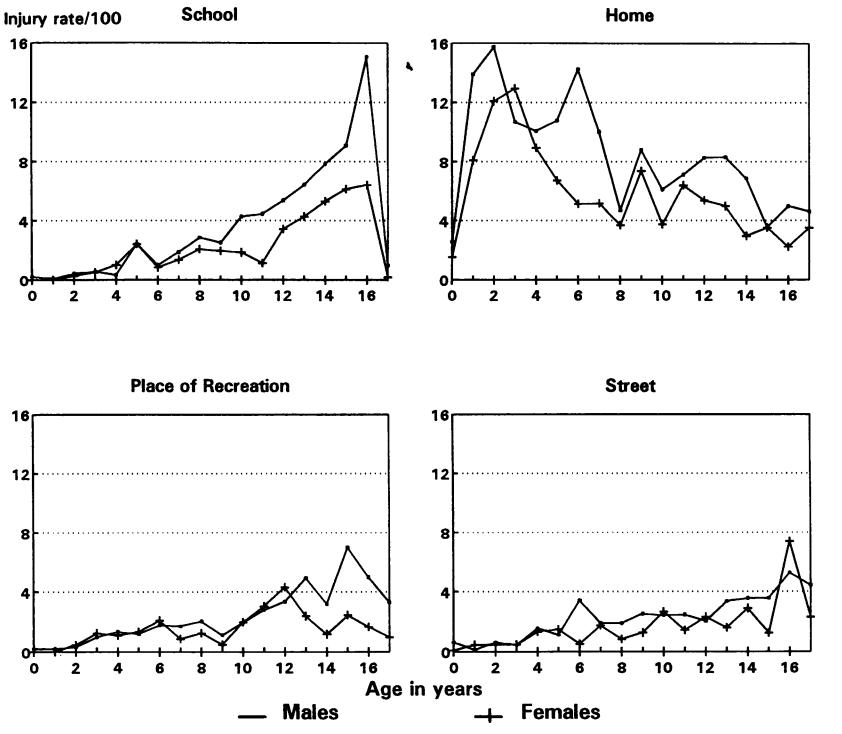


FIGURE 1—Injury rates for four selected locations, by age and gender.

Location and Cause

Rates and total estimated injuries are presented by location and cause in Table 2. For each location, the total number of estimated injuries for the US population to 17 years of age is given in the row of totals at the bottom. For each cause, the estimated number of injuries is given in the last column. These estimates were not adjusted for recall period because the number of injuries for each separate cause and location was too small for stable estimates. Almost one half (44%) of injuries were reported to have occurred in the home, and about 19% were reported to have occurred at school. Falls and being struck or cut accounted for approximately half of all reported causes, and injuries involving sports or recreation, bikes and skates, and transportation also accounted for a considerable proportion of injuries.

The four principal locations of injuries by age and gender are shown in Figure 1. Since 62% of injuries occurred at home and at school (Table 2), the high frequencies of such events occurring in the home at young ages and at school in adolescence reflect where children spend most of their time and engage in most of their activity.

The age distributions were very different for the six principal causes of injury shown in Figure 2. For all causes of injury, boys tended to have higher rates than girls, especially at the older ages.

The proportions of reported medically attended nonfatal injuries by cause are displayed for each of the four age groups in Figure 3. For purposes of comparison with fatal injuries by cause, percentages of deaths resulting from injury for the same year (1988) are included by age group. The same ICD-9 E-code groupings were used for both fatal and nonfatal injuries. The proportions of nonfatal injuries by cause differed considerably from those of fatal injuries. In no age group were the three most frequent causes for nonfatal injuries the same as for fatal injuries. In the 1- to 4-year age group, falls and being struck or cut far exceeded all other causes, constituting more than half of medically attended nonfatal injuries. Burns represented about 8% of nonfatal injuries but caused about

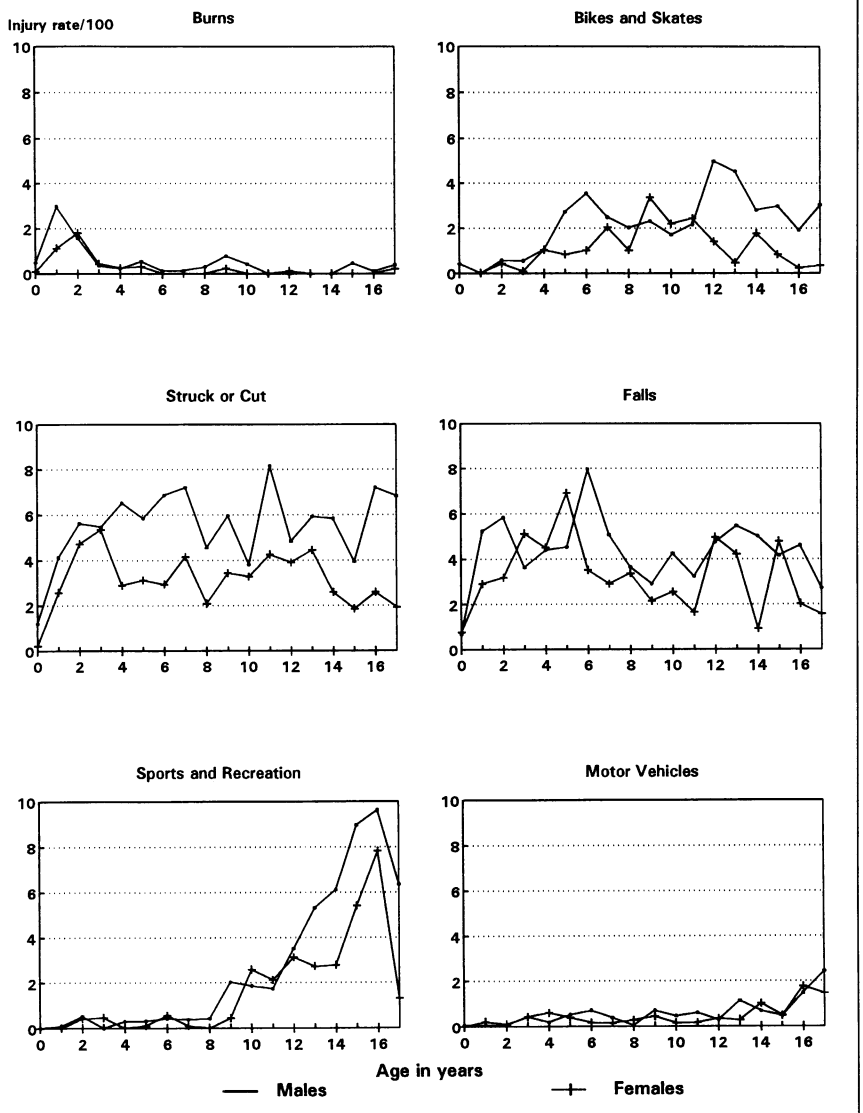


FIGURE 2—Injury rates for six selected causes, by age and gender.

one third of the fatalities and were the leading cause of death. The two leading causes of nonfatal injuries in the 5- to 9-year age group were, again, falls and being struck or cut. However, injuries associated with bikes and skates were also relatively frequent. In the same age group, pedestrian and motor vehicle accidents were the major causes of fatal injuries. In the 10- to 13-year age group, nonfatal injuries from sports were almost as common as those from falls and being struck or cut. Motor vehicle accidents accounted for less than 5% of nonfatal injuries but were the leading cause of fatal injuries. Finally, in the 14- to 17-year age group, sports-related accidents were the leading cause of nonfatal injuries, but motor vehicle injuries far exceeded all other causes of death.

Discussion

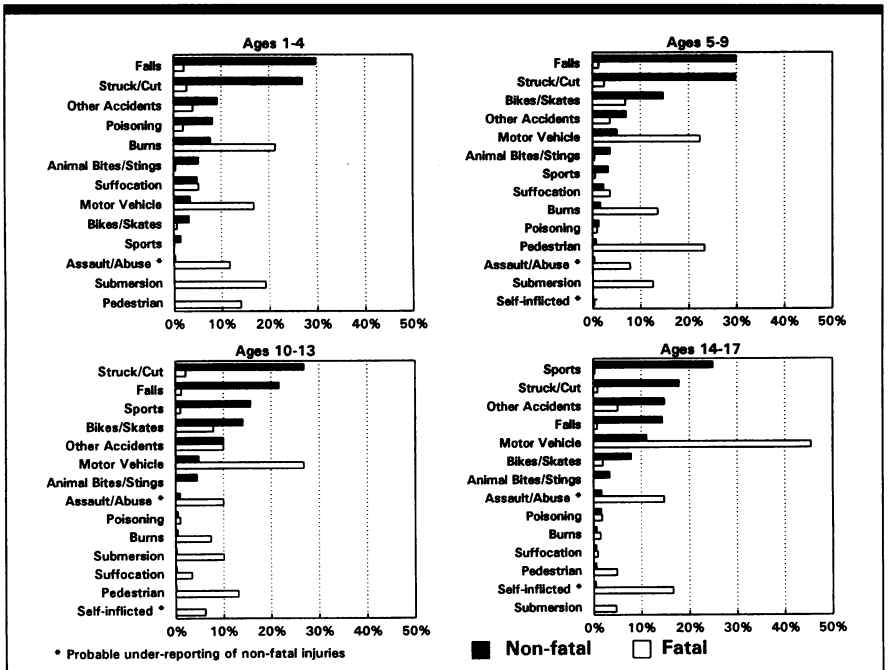
These data improve on previous efforts to provide nationally representative estimates of nonfatal medically attended injuries in childhood by cause and location.[10,16–18] Previous reports have estimated that one fifth[16] to one fourth[17,18] of children and adolescents in the United States experience an injury requiring medical attention each year. An analysis of the 1981 NHIS, using a 2-week recall interval estimated an incidence of 24.3 injuries per 100 children per year,[17] and the Statewide Childhood Injury Prevention Project, involving 14 communities in Massachusetts, reported an annual rate of 22.4 injuries per 100 children requiring hospital admission or emergency room visits.[10] These findings from the 1988 NHIS Child Health Supplement reveal that medically attended injuries occur in at least 25% of children annually. One third of these injuries are serious and require surgery, bed restriction, and loss of school or normal activity for 1 day or more. Thus, the adjusted rate of injury from the 1988 Child Health Supplement is consistent with the findings of Gallagher et al.,[10] Barancik et al.,[16] Harel,[17] and other population-based studies.[19–21]

In this study, injury rates varied considerably by gender, age, and location. At virtually all ages, boys had higher injury rates than girls for all locations and most causes. These findings are consistent with those of other studies and analyses.[10,17,20–23] The pattern of injuries reflected activities associated with the stage of development for specific subgroups. For example, bicycle and skate injuries occurred almost exclusively during the elementary and middle school ages, the periods in which children are most commonly engaged in bicycling activities. The shift in location of injuries from home to school in early adolescence (Figure 1) reflected changes in behavioral conditions and the amount of time spent in each respective location.

According to the annual medically attended nonfatal injury rates estimated in this analysis, 16 614 000 children and adolescents experienced an injury in 1988. Strategies for prevention of injuries have been proposed by various injury control workers and programs.[24–28] Although a detailed analysis and projection of possible reductions of unintentional injuries based on existing and potential strategies[29] is beyond the scope of this discussion, the proposed national objective[27] of an 11% reduction, if successful, could avert approximately 1.9 million injuries per year. Identification of risk factors, environmental and psychosocial determinants, and other factors should facilitate and enhance these potential reductions.

The distributions of nonfatal, medically attended injuries differed dramatically from those of fatal injuries in children and adolescents in 1988. It follows that determinants and causal factors for fatal injuries may differ from those for non-fatal injuries treated in emergency rooms and other ambulatory care settings. Because the causes of fatal and nonfatal injuries may or may not be similar, this study cannot provide conclusions regarding common causal mechanisms.

The adjustment for recall significantly raised the estimated rates of inju-



Note. Causes are rank ordered by nonfatal injury rates.

FIGURE 3—Percentage distribution of nonfatal and fatal injuries for four age groups, by cause.

ries for all ages; however, the effect of adjustment for this loss was not uniform across subgroups. The 1- to 4-year age group showed the greatest adjustment for recall and the highest proportion of minor injuries, which may reflect the concern of parents for injury events occurring to infants and young children. As shown by Harel[17] and Rivara et al.,[30] the tendency over time to discount or forget less serious injuries and to remember more severe injuries probably results from the fact that parents are more likely to recall those injuries causing substantial disruption of daily activities.

Since parents were the reporting source for most subjects, intentionality would frequently have been unknown or, in some instances, purposefully underreported. Thus, the reporting of violent or intentional injuries was likely to be underrepresented and was of limited value in this survey.

Although death rates from injuries of all causes are inversely related to socioeconomic status,[29,31,32] the Child Health Supplement data show that nonfatal injury rates were either stable or increased with increasing maternal education, family income, and access to health care. Similarly, Wagener observed that working Blacks reported fewer injuries requiring medical attention than working Whites.[33] These socioeconomic and racial differences are probably the combined result of care-seeking behavior, access to care, and a reporting bias. However, the possibility that nonfatal and relatively minor injuries are also positively associated with socioeconomic status is suggested by the elevated rates of bicycle and sports injuries reported here for children in families with an income above $40 000. Another analysis of these data showed that lack of medical care coverage (health insurance or Medicaid) has the effect of decreasing the total rate of reported medically attended injuries by as much as 30% relative to rates for children without coverage.[34]

In summary, this report presents an epidemiological overview of the basic frequencies and distribution of nonfatal injuries experienced by children in the United States. These data provide a national reference or perspective for other studies on specific injuries, causes, or risk factors. More extensive analyses focused on the associations and interactions of specific risk factors, such as family use of alcohol, psychosocial determinants of injury, socioeconomic factors, and sports injuries, are planned, are under way, or have been published.[35,36] Exploration of risk factors and their interactions and relationships with injuries can contribute new hypotheses regarding causal and modulating factors and ultimately lead to the development of new interventions for prevention of injuries. □

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References

1. Gordon JE. The epidemiology of accidents. *Am J Public Health.* 1949;39:504–515.
2. Wheatley G. Child accident reduction: a challenge to the pediatrician. *Pediatrics.* 1949;2:367–368. Editorial.
3. Committee on Trauma Research, Commission on Life Sciences, National Research Council and the Institute of Medicine. *Injury in America.* Washington, DC: National Academy Press; 1985.
4. Rodriguez JG. Childhood injuries in the United States: a priority issue. *Am J Dis Child.* 1990;144:625–626.
5. Scheidt PC. Behavioral research toward prevention of childhood injury. *Am J Dis Child.* 1988;142:612–617.
6. Baker SP, O'Neill B, Ginsburg MJ, Li G. *The Injury Fact Book.* 2nd ed. New York, NY: Oxford University Press; 1992.
7. Robertson LS. *Injury Epidemiology.* New York, NY: Oxford University Press; 1992.
8. *International Classification of Diseases, 9th Revision, Clinical Modification.* Washington, DC: US Dept of Health and Human Services; 1980. DHHS publication PHS 80-1260.
9. *Mortality, Volume II, Part A.* Hyattsville, Md: National Center for Health Statistics; 1991.
10. Gallagher SS, Ginison K, Guyer B, et al. The incidence of injuries among 87 000 Massachusetts children and adolescents: results of the 1980–81 Statewide Childhood Injury Prevention Program Surveillance System. *Am J Public Health.* 1984;74:1340–1347.
11. Division of Injury Control, Center for Environmental Health and Injury Control, Centers for Disease Control. Childhood injuries in the United States. *Am J Dis Child.* 1990;144:627–646.
12. Guyer B, Ellers B. Childhood injuries in the United States: mortality, morbidity and cost. *Am J Dis Child.* 1990;144:649–652.
13. National Committee for Injury Prevention and Control. *Injury Prevention: Meeting the Challenge.* New York, NY: Oxford University Press; 1989.
14. National Center for Health Statistics. Design and estimation for the National Health Interview Survey, 1985–94. *Vital Health Stat [2].* 1989;110. DHHS publication PHS 89-1384.
15. Harel Y, Overpeck MD, Jones DJ, et al. Effects of recall on estimating annual non-fatal injury rates for children and youth. *Am J Public Health.* 1994;84:599–605.
16. Barancik JI, Chatterjee BF, Greene YC, et al. Northeastern Ohio Trauma Study: I. Magnitude of the problem. *Am J Public Health.* 1983;73:746–751.

17. Harel Y. *Family Psychosocial Contributors to Childhood Injuries.* Ann Arbor, Mich: Microfilm International; 1988;49(12). No. 8907049.
18. *Types of Injures by Selected Characteristics: United States, 1985–87. Series 10: Data for the National Health Survey, No. 175.* Washington, DC: National Center for Health Statistics; 1991. DHHS publication PHS 91-1503.
19. Langley JD, Silva PA, Williams SM, et al. Accidental injuries in the sixth and seventh years of life: a report from the Dunedin Multidisciplinary Child Development Study. *NZ Med J.* 1981;93:344–347.
20. Fife D, Barancik JI, Chatterjee BF. Northeastern Ohio Trauma Study: II. Injury rates by age, sex, and cause. *Am J Public Health.* 1984;74:473–478.
21. Gofin R, Palti H, Adler B, et al. Childhood injuries: a population-based study of emergency room visits in Jerusalem. *Paediatr Perinat Epidemiol.* 1989;3:174–188.
22. Irwin CE, Cataldo MF, Matheny AP, Peterson L. Health consequences of behaviors: injury as a model. *Pediatrics.* 1992; 90(suppl):798–807.
23. Rivara FP, Bergman AB, LoGerfo JP, et al. Epidemiology of childhood injuries: sex differences in injury rates. *Am J Dis Child.* 1982;136:502–506.
24. *Injury Control for Mothers and Children.* Elk Grove Village, Ill: American Academy of Pediatrics; 1987.
25. Speigel CN, Lindaman FC. Children can't fly: a program to prevent childhood morbidity and mortality from window falls. *Am J Public Health.* 1982;72:392–393.
26. Kravitz H, Grove M. Prevention of accidental falls in infancy by counseling mothers. *Ill Med J.* 1973;143:570–573.
27. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives.* Washington, DC: US Dept of Health and Human Services; 1991. DHHS publication PHS 91-50212.
28. Strong W, Linder C. Preparticipation health evaluation for competitive sports. *Pediatr Rev.* 1982;4:113–121.
29. Rivara FP. Traumatic deaths of children in the United States: currently available prevention strategies. *Pediatrics.* 1985;75:456–462.
30. Rivara FP, Thompson RS, Thompson DC, et al. Injuries to children and adolescents: impact on physical health. *Pediatrics.* 1991; 88:783–788.
31. Fingerhut LA, Kleinman JC, Malloy MH, et al. Injury fatalities among children. *Public Health Rep.* 1988;103:399–405.
32. Durkin MS, Davidson LL, Kuhn L, et al. Low-income neighborhoods and the risk of severe pediatric injury: a small-area analysis in northern Manhattan. *Am J Public Health.* 1994;84:587–592.
33. Wagener DK, Winn DW. Injuries in working populations: Black–White differences. *Am J Public Health.* 1991;81:1408–1415.
34. Overpeck MD, Kotch JB. Effect of access to care on medical attention for injuries. *Am J Public Health.* In press.
35. Bijur PE, Kurzon MS, Overpeck MD, et al. Parental alcohol use, problem drinking and children's injuries. *JAMA.* 1992;267:3166–3171.
36. Overpeck MD, Kotch MD, Trumble AC. Effects of maternal education and access to medical care on analysis of injury risk according to patterns of child care. In: *Proceedings of the 1993 Public Health Conference on Records and Statistics.* Hyattsville, Md: US Dept of Health and Human Services; 1993. DHHS publication PHS 94-1214.

Call for Abstracts for Injury Control Late-Breaker Session

The Injury Control and Emergency Health Services Section of the American Public Health Association will again feature a late-breaker session during the upcoming APHA annual meeting October 29 through November 2, 1995, in San Diego, Calif. The session will be held on Wednesday, November 1, at 8:30 a.m. and will feature work completed within the last few months, after the deadline for consideration in the regular symposia of the APHA annual meeting.

Abstracts of 250 words or fewer will be accepted by the section until *September 1, 1995.* No special form is required. Please send or fax the abstract, title of paper, author's name, address, and telephone and fax numbers to Joe Sniezek, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Mail Stop F-41, 4770 Buford Hwy, NE, Chamblee, GA 30341-3724; tel (404) 488-4031; fax (404) 488-4338. All submitters will be notified of the decision by fax by September 25.